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# Industrial Finishing

Reg. U. S. Pat. Off.

*An Independent Publication Devoted to the Finishing of Industrial Products*

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# Letters »

The names and addresses of those whose letters and inquiries appear in this department may be had by writing this office, or letters addressed to them in care of this office will be forwarded promptly.—The Editor

## Color Schemes Wanted

Can you supply us with any color schemes pertaining to furniture and automobiles—or perhaps you can tell us how to secure same.—O. F. Sales Co.

## Compressed Air Line Drainage

We have read with considerable interest, the article by F. T. Harrison on "Air Compressors" in the September issue of INDUSTRIAL FINISHING, but wish to ask if you can give us a little information on one or two points.

On page 9, under "Pipe Drainage," in the 6th line, he says, "this should be collected just beyond the elbow through which the air stream turns to be conducted horizontally." We are wondering if there is an automatic valve or trap that can be used at this point? If so, can you tell us who manufactures them?—U. F. Furn. Co.

Editor's Note: See another article on this subject elsewhere in this issue.

## Refinisher's Lacquer

What kind of lacquer finish can I use on a varnish finish—one that will not "kick up" after being refinished—such as one finds on table tops and dressers?—T. F. & R. L. & Co.

## Chicago Custom Finishers

Some time ago we sent you an inquiry regarding cut-out wood letters and were gratified to receive letters from all over the country from manufacturers who are equipped to

*(Continued on page 6)*

# From the Editor's Desk

**The Election** Presidential campaigns are traditionally periods of slack business. The tendency is to wait and see what happens before making plans for the future. We now know what happened and are in a position to look forward. Even those who are disappointed with the result realize that facts must be accepted as they are. It would be stupid not to make most of what is ahead.

**Business** What we need is business, jobs for the unemployed and better prices for producers. There is not an industry that is not in need of large quantities of supplies. There is no class of citizens that is not short of almost every essential of life, to say nothing of the luxuries. Every one who has an income needs something he or she can afford to buy, and should purchase.

**Needs** Many millions of automobiles will be required to supply the shortage that has developed in the last three years. Many tons of rails are needed to meet the normal demands of the railroads. We are short of almost every article we use or need. There is a tremendous volume of potential business that is awaiting action on the part of those who are prepared and should buy.

**Confidence** The government has done much to cope with the worst phases of the depression. Bank credit and confidence have been reestablished. Money has been made available to cities and industries to take care of distress. The government can, and has, made it possible for business to function in a normal way, but it can not make us buy unless we are willing.

**Action** The people have it in their own power to help themselves. They can not do that by sitting back and doing nothing. If those who can and should will forget politics and get busy in business, all will benefit. If you need something and have the money, buy it! If you can use another man, employ him! Such cooperation is cumulative and soon will produce a very marked improvement in the condition of all of us.—*The Indianapolis Star.*

R. H. Rohr

**Spra-More Junior**

**Price, Complete $49.75**

An ideal spray painting outfit for the small manufacturer where portability and fast material application are needed. Light and compact, yet handles many heavy duty jobs. Ruggedly constructed to give long wear. Diaphragm compressor prevents oil and air contact. No belts, direct shaft drive. Completely enclosed in single housing. Weight 37 lbs. Write for full details.

**CROWN SPRAY GUN MFG. CO.**
**1218 Venice Blvd. Los Angeles, Calif.**

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*Outstanding*
*Distinctive*

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PEARL
ESSENCE

FINISHES

**JOS. H. MEYER BROS.**
**220 25th St. Brooklyn, N. Y.**

*(Continued from page 4)*

handle our requirements. We appreciate very much your assistance.

Many times we purchase these cut-out wood letters from firms who are not equipped to air brush them—and we again ask your kind assistance to advise us if there are any firms in Chicago who make a specialty of finishing wood, or firms who may be interested in finishing cut-out wood letters for us.

We will greatly appreciate any information you can forward us, and will be pleased to have you, if you desire, insert this letter in your magazine.—I.W.&Co. (Signs, Displays, Novelties)

## Decalcomanias Wanted

A customer of ours abroad is interested in decalcomanias for imitation veneers, and if we are correctly informed, a recent issue of INDUSTRIAL FINISHING carried an advertisement of the Sans Darb Corporation, who make such decalcomanias.

If this is correct, will you be good enough to let us have the correct name and address of the firm, so that we may communicate with them in reference to his business.—U.T.X. Co. (Finishing Materials)

## Complete Spraying Equipment

(No. 1.) Will you kindly favor us or advise how we can obtain the addresses of the manufacturers of spraying equipment, including compressor or such that covers a complete installation for spraying cast iron?—N. T. Machine Co. (Stencil Machines)

(No. 2.) Kindly refer this inquiry to several reliable concerns who are in a position to furnish us with instructive information on spray booths and finishing equipment, quoting us on same and mailing us descriptive literature on each.—T. Mfg. Co. (Wood Turnings)

## Lacquers Fabrics

In the September issue of INDUSTRIAL FINISHING, on page 2, we notice an inquiry from one of your subscribers requesting information regarding concerns who do lacquer coating on fabrics. We would be glad to have you advise your subscriber that we are in a position to

*(Continued on page 43)*

# *Eliminating*

# Oil and Water from Compressed Air Lines

by J. E. Swendeman

COMPRESSED air always contains more or less moisture, depending on the condition of the air taken into the compressor, and in rainy and humid weather the moisture is excessive. This moisture, because of the heated condition of the air as it leaves the compressor, does not manifest itself until the air has become cool; with a drop in temperature, moisture will be precipitated. This precipitation continues just as long as there is a continued drop in temperature and until the air has reached a temperature of approximately 20° above zero.

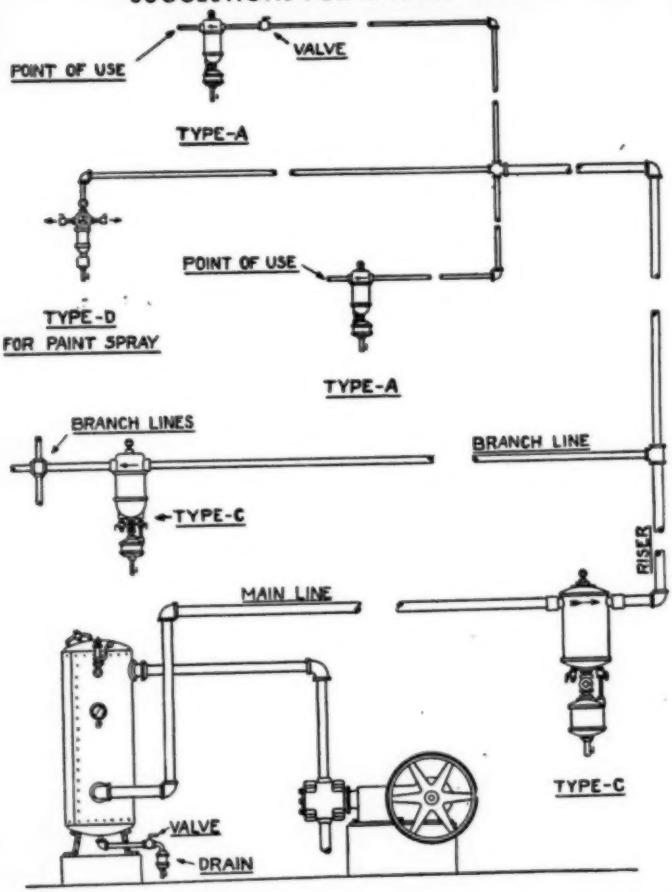
**Give your finisher clean air, compressed air free from all trace of oil, dirt or water — and one source of mysterious trouble in the finishing room will immediately disappear.**

A compressor that has a capacity of 2,000-cu. ft. (piston displacement), pumping air of 75% relative humidity at an inlet temperature of 82°F., will take in about 1,200-lbs. of vapor, or three barrels of water, every eight hours. Even with an outdoor intake, high relative humidity at a temperature of 80° to 90°F. often occurs during the summer months in the large industrial centers of the country; it is readily apparent, therefore, that vast quantities of water are taken into air compressors.

Even where lower temperatures prevail, a high relative humidity frequently raises the moisture content of the atmosphere to a point that few realize. Seven thousand cubic feet of saturated (100% relative humidity) air at 70°F. contain one gallon of water. When this air is compressed to 100-lbs. and then cooled to 70°F., it will hold less than 1/7 of its original volume of water.

The remaining 6/7-gallon of water condenses in the air system, and much of it reaches spray guns, pneumatic tools and air-operated machines unless provision is made for removing it. The damage that occurs from excessive moisture or oil in spray lines is well known to all finishers. Little brown specks, milky finish,

## SUGGESTIONS FOR INSTALLATION

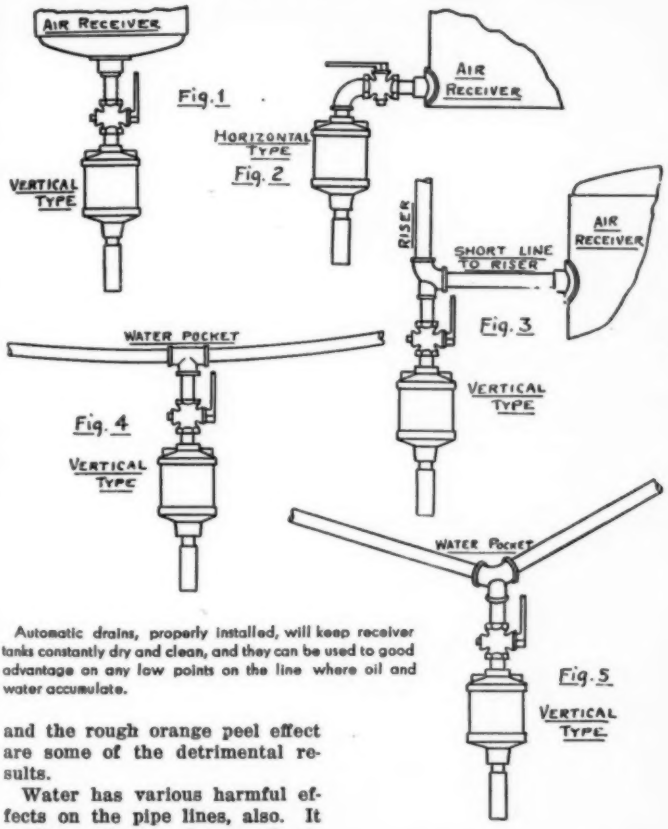



Type "A" — Used in installations where pressure regulation is not necessary and where air may be shut off while valve and screen are removed for cleaning. Particularly recommended for small outlet installations. A valve placed at inlet to separator is desirable.

Type "C" — Can be used on all work, same as Type "A", but it has the advantage of the valve equipment between separator body and eliminator. This makes it possible to clean valve and not interfere with air supply beyond separator. Recommended for main line installations and in applications where air is in constant use.

Type "D" — Used where pressure regulation is essential, such as in spray painting. It has four outlets, permitting the use of four spray guns.

## DRAIN APPLICATIONS




Automatic drains, properly installed, will keep receiver tanks constantly dry and clean, and they can be used to good advantage on any low points on the line where oil and water accumulate.

and the rough orange peel effect are some of the detrimental results.

Water has various harmful effects on the pipe lines, also. It produces "water hammer," reduces the carrying capacity of the lines, causes loss of power by accumulating at low points, and may freeze and burst the pipes in cold weather.

As air passes through the compressor it takes up more or less oil in the form of oil vapor. The compressor is lubricated in a manner similar to an automobile engine. Oil that gets by the pistons of an automobile engine finds its way to the exhaust and is discharged in gaseous form to the atmosphere, but such oil from the compressor has no outlet except through the compressed air system, and out to the atmosphere

through spray guns or other apparatus where compressed air is being used.

Water and oil are always present in compressed air lines. They must be removed in order to obtain efficient operation of pneumatic tools and machines, and to prevent defects in production in the many operations where air is used.

Free water which forms will slowly settle out of the air if it is quiet long enough. If air in this condition is passing through a pipe, the water will wet the interior and trickle down to the bottom, where in turn it will form a flowing stream and be carried along with the air current.

It is a proven fact that condensation will not precipitate into a trap or any air-bound receptacle while the compressed air is in motion. A trap or any device being hand operated is a closed receptacle and is, therefore, air-bound. Any water precipitated into such air-bound receptacle, while the air was quiet, will again be picked up when the air reaches sufficient velocity.

A newly developed separator for use in compressed air lines employs in its operation a venting principle by which the complete elimination of oil and moisture from compressed air can be accomplished. The separator, through the eliminator, is vented to the atmosphere. The eliminator is an indispensable part of the separator, as it receives all moisture and foreign matter collected by the separator and expels it immediately, thereby preventing the compressed air from picking it up again.

The eliminator on this separator is not a trap. It is never closed and retains no oil or water, and no oil or water can get by it. Drawing off oil and water by hand-operated valves affords only partial and temporary relief, for as soon as the valve is closed, oil and water again accumulate, continually saturating the air, necessitating frequent repetition of the operation.

A separator should be placed as close as possible to the point where the air is being used, so that there will be no further drop in temperature between the separator and the apparatus in which the air is used. Naturally the separator cannot control temperature beyond its outlet; therefore, if there is a further drop in temperature after the air leaves the separator, there will be more precipitation.

Where air is transmitted any great distance, and branch lines are taken off at several points, a main line separator is desirable and should be installed just ahead of the branch lines, and as far from the compressor as possible. A separator so installed is highly beneficial. It acts as a secondary receiver and it gives extra storage capacity. It cleans the line of all oil and scum which has collected in the pipe up to that point, and deposits same in the eliminator of the separator, where it is occasionally blown out at will, without shutting off the air supply beyond the separator. Besides this, it automatically removes all the oil and moisture from the line up to that point.

The size and type of separator recommended is determined by the kind of service required of it. Suitable separators are designed for normal operating conditions, and the dimensions are kept to the lowest practical limit. In ap-

plications not requiring an unusually large amount of air, a separator the same size as the air supply pipe size is recommended. A separator should never be smaller than the pipe size to which it is to be attached. The larger the separator for the work, the greater the factor of safety in assuring clean, dry air.

There are some uses in which oversize separators may be required. Whenever a separator is to be used on work where there is an uninterrupted flow of air at high velocity, such as sandblast machines and similar apparatus, a separator larger than the pipe size of the air supply to the machines may be required, and the question of size should be taken up with a competent engineering department. The larger size is necessary to slow down the velocity of the air going through the separator, and allows a greater area within the separator for greater expansion, thinning out the air and holding the air in suspension until all the moisture and oil have precipitated into the eliminator.

In service where there is an uninterrupted flow of air, not more than one tool or machine should be operated from one separator. The type of separator required is determined by the service, but the selection is not difficult if one consults the engineering departments or catalogs of concerns who specialize in the manufacture, sale or installation of modern compressed air equipment.

---

Burwood carvings can be treated and finished the same as natural wood, according to Burwood Carved Products Co., Owosso, Mich.

## Burning in Shellac

IN REFINISHING and repairing the finish on furniture, etc., a knife is commonly used to "burn in" shellac to fill small defects in

Typical burning-in "iron"

the finish. The job may be done much more rapidly by using two tools like the one shown here, keeping one of them over the flame while the other is in use.

The business end of the tool consists of a 1½-in. length of ½x½-in. square brass. This brass is beveled sharply at one end and tapped at the other end to receive a short length of threaded iron rod which fits tightly into a hole in the wood handle.—J. C. C.

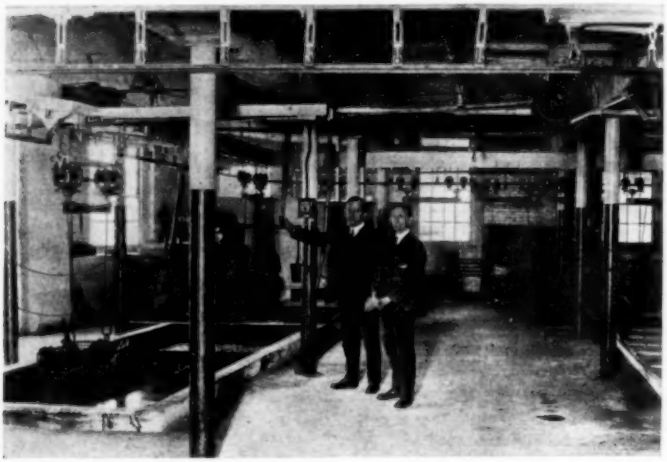
---

## Tests Films of Paint and Varnish

It is generally estimated that one gallon of average mixed paint can be brushed out to cover approximately 535-sq.ft. on an average surface, and that the thickness of such a single coat will be about .003-in. thick.

Estimating in the same way, one gallon of average varnish can be brushed out to cover approximately 800-sq.ft., and the thickness of such a coat will be about .002-in.

In answer to the call for an instrument with which any number of test paint and varnish films can be made to correspond to the above thicknesses—all exact duplicates—the Parks Equipment Co., Bourse Bldg., Philadelphia, Pa., advises that: "We have added to our stock sizes of new model Film-O-Graphs for mixed paint and like products, one with a step .003-in. deep, and for varnish and like products, one with a step .002-in. deep. Neither requires a plunger. A few drops of paint or varnish put into these Film-O-Graphs will flow out evenly when the charged Film-O-Graph is drawn across a smooth flat surface of tin, glass or other suitable test strip supported in level position. These films will be, when so laid down, .003-in. or .002-in. thick, and will serve as a basis for strictly comparative testing in the laboratory."



# Dip Finishing by Machine

by Louis Bodor, M. E.
The Apex Products Co.
Designers and Builders
of Special Machinery

SINCE LACQUER finishing has become so popular, there has been an increasing demand for an economical and quick method of applying it. After several years of experimental work, we have come to the conclusion that practically any shaped article, up to a reasonable size, can be dip-finished by machine. Of course, a thorough analysis of the article is necessary in order to determine the best procedure for dipping. The important points are the correct angle at which the article is inserted, and the proper timing. It can be readily seen that a machine with variable speed control is essential for utmost flexibility.

Proper dipping equipment can be used for dipping a great variety of articles, such as garden tools, wire goods, toys, pencils, automobile pump tubes, oil cans, etc., and it is particularly satisfactory when used for finishing handles, either wooden or metal, up to a length of about 22-in.

Now that machine dipping has become so important, lacquer manufacturers can furnish a special type of lacquer made expressly for a slow drawing process. There are several colored enamels now on the market which will give

# Speaking of Synthetic Enamels

ZAPON S-52

ZAPON S-53

These two Zapon favorites are increasing in popularity on sheer merit. Available in all popular shades, they are finding greater acceptance wherever high gloss and durable finish are desired at a low cost.

*Both these enamels*

- Spray evenly
- Give maximum coverage in one application
- Adhere tenaciously to metal or wood surfaces
- Dry with a high gloss.

Their economy is emphasized by the fact that best results are obtained when the enamels are thinned 30 to 40 percent.

**S-52—BAKING TIME**
2 HOURS at 225° F

**S-53—AIR DRYING TIME**
sets in half an hour, and hardens overnight to a tough flexible finish.

*ZAPON LABORATORIES are prepared to supply specific information to all your questions about lacquers and enamels. This service is FREE TO YOU.*

*"The Standard of Quality Since 1884"*

## THE ZAPON COMPANY

*A Subsidiary of Atlas Powder Company*

**Stamford** ZAPON **Connecticut**

a high gloss finish without the necessity of applying a top coat of glossy lacquer, thus a good finish can be obtained—with one coat—if it is applied in the proper manner. By a "good finish" I mean that there is a thorough enamel-like covering, which will not scratch or chip with reasonable tests, and that there will be no drips, sags or discolorations in the finish.

There are several important advantages to machine dipping, which I would place in the following order:

1—There is absolutely no waste of lacquer, since there are no drips as in hand dipping, nor is there the waste which is incurred when spraying small articles.

2—There is a thoroughly uniform production, both as a whole and also regarding each item.

3—A large production may be attained with a minimum of labor and space.

4—Air drying process eliminates baking.

A machine of this type can be operated by unskilled labor, properly instructed by the manufacturers' technical advisers, and is the solution to many difficult finishing problems.

## Refinishing Reed and Fiber

IN RE-FINISHING old baby carriages, whether they are made of genuine reed or of fiber, care must be exercised in removing of the old finish before attempting to put on new coats. The pores of the reed form an excellent foundation for the enamel, consequently it is necessary that as much of the old finish as possible be removed so that the new undercoat may penetrate the pores. There are, no doubt, many methods for doing this, but we have found, after experimenting a number of years that a chemical remover solution (name on request) is the best solvent.

The enamel on the steel parts of the baby cab should be entirely stripped off by immersing it in the (chemical remover) solution tank for an hour; then using a steel brush to remove the scum, and then carefully rinsing the parts so that all the chemical solution is removed to prevent it from loosening the new enamel after it is applied. The reed bodies and hoods may be safely scrubbed with the solution, but the fiber ones must be carefully washed to prevent softening the fiber.

Wire spoke wheels may be put in the chemical solution, but wood wheels must be scraped, as the solution would loosen the glue which holds the spokes in the center of the wheel. After the body, hood, and gear have been thoroughly rinsed and are perfectly dry an enamel undercoat is sprayed on. Twenty-four hours later the enamel coat is sprayed on and this is allowed to dry for three days before decorating, striping, and assembling the body and gear.

This process insures a satisfactory enamel job. Of course, it is necessary to use good undercoat and enamel, or all the preparation is wasted.—E. O. PAHL, E. F. Pahl Co. (High grade baby carriages)

---

Cleanliness beneath finish drums may be obtained by placing a metal trough beneath the outlet, in order to catch stray drippings which will otherwise fall on the floor and be difficult to clean up.

# What can I do to pep up sales?

Here I am with the best line of products on the market....best in design....best in construction....best in materials....yet competition is outselling me. The trouble is, their stuff looks better because they give it a fine finish.

By George, I have it....I'll send a few samples to the Rockford Varnish Company and let their studio work out a finish for my line that will make 'em all sit up and take notice.

ROCKFORD VARNISH CO.
ROCKFORD, ILLINOIS

Kindly mention INDUSTRIAL FINISHING when writing advertisers

# Cracks and Crazes in Furniture Finishes » »

## by C. Dan Youngs

**The Old Man was on the warpath! The plant superintendent and foreman finisher were on the carpet, having a difficult time explaining to their i rate superior.**

**"In the past three months," he declared, as he rapidly thumbed over a sheaf of correspondence, "we have had 16 complaints from our dealers who have shipped back furniture for refinishing because our finish checks after it leaves our plant. No telling how much repeat business we have lost because dealers won't take a chance after seeing our finish. I'm telling you right now this must be stopped. That's all, gentlemen."**

DURING the many years when varnish was "the only certain and proven method of beautiful furniture finishing," the complaints which arose were considered, for the most part, as being inseparable from its use. Checks resulting from improperly dried coats, too heavy applications, sudden changes in temperature, improperly dried woods were all taken as a matter of course, and steps taken to remedy such defects.

But when lacquer displaced varnish as a finishing media, it was considered and looked upon as being an entirely different product owing to different drying and working qualities. Very few finishers stopped to think of the great similarity between these two products. Since varnish and other oleoresinous products dry by oxidation, and lacquer dries by evaporation, it was believed that the two were basically and materially different. Investigation, however, develops the fact that the two are comparable, both in composition and in wearing qualities.

Varnish is composed of gums, vegetable drying oils, thinners and driers. Nitrocellulose products are composed of gums, thinners, soluble cotton and plasticizers; but since the driers in varnish and the plasticizers in lacquer are merely incidental and have no lasting action on the film, the difference in their nature may be passed by. It is, of course, obvious that all these ingredients differ considerably in nature but their ultimate aim is the same—the production of a protective film of lasting qualities.

Because of this similarity, it has developed that there is a close connection between the checks and cracks in lacquer and varnish films when applied over the same types and kinds of wood. In the case of both classes of finishing material, these cracks may be roughly segregated into four distinct kinds as follows:

# *Try this*

## Alcohol-Resistant Lacquer

### *priced for quantity production*

ALCOHOL solutions, fruit acids, ammonia, submerging in water, and the usual tests for any good lacquer leave No. 6390 unblemished.

A true quality lacquer in every respect, yet it is priced for use on large scale production.

No. 6390 has better body, tougher film and a crystal clearness. Sprays smoothly and rubs easily. Made in gloss and any degree of flatness.

Try five gallons at the drum price, returnable at our expense if you are not well satisfied.

**JAMES B. DAY & CO.**
**CHICAGO**

***Enamel, Sealer, Lacquer, Shellac, Stain, etc.***

1—Temperature checks, sometimes known as cross checks.

2—Moisture or humidity cracks.

3—Overcoating or casehardening cracks.

4—Old age cracks.

### Temperature Cracks

Temperature cracks may be recognized, as their common name suggests, by checks directly across the grain of the wood; they are caused by sudden drops in temperature followed by equally sudden rises. These differ in varnish and lacquer, since in the case of the former they sometimes apparently disappear when the piece is returned to normal temperature.

In the case of lacquer they remain permanently but they vary considerably in nature according to the flexibility of the lacquer. It seems odd, but it is a fact that the more flexible the lacquer the larger and more readily apparent are these cross checks. The reason for this is that varnish absorbs oxygen and increases in volume and "gives" under pressure to the limit of its elasticity, while lacquer films merely resist the pressure until the film is finally broken.

These temperature checks will not always show at the first exposure to a change in temperature, that is, without the aid of a microscope, but repetition causes them to increase in size until they become visible to the naked eye. This is sometimes inadvertently caused by the sudden removal of the furniture from the warmer temperature of the finishing or storage rooms to the chill atmosphere of the shipping department platform, and is sometimes caused by the opposite procedure, namely the transferring of a piece suddenly from a cold room to one of much higher temperature.

Thus, although the furniture apparently leaves the plant in first class condition, yet the seeds of film-disintegration have been sown, and the movement in transit, or in the dealer's warehouse, completes the debacle. In extreme weather, furniture being prepared for shipment should be handled much along the same lines as a diver coming up from under deep water; it should be prepared by degrees so there will be no ill effects from abrupt changes.

### Moisture or Humidity Cracks

Wood is spongelike at times in its capacity for moisture absorption, and as this moisture penetrates, it causes swelling. In open-grained woods this is often mistaken for shrinking of the finish as the higher parts push themselves upward. But this action is diametrically opposite to shrinking, or sinking into the pores, since the wood raises itself in spots, so in this case the check must be directly with the grain.

This is most probable on humid days, or when the wood is exposed to moisture, so if this swelling exerts a greater force than the finish can withstand, checks occur. As is the case with temperature checks, if they are not sufficiently large, a return to normal temperature will often cause them to disappear from a varnish film, but if the lacquer film is broken, the defect is permanent.

One cause of this trouble, which is many times overlooked, is that the wood was not thoroughly kiln-dried and that moisture is present deep within it at the time the finish is applied. Then, exposure to prolonged heat causes the moisture to seek the surface, breaking the film.

# Two fast workers

## Imperial *Rapid* Brush Cleaner

The *faster* a brush cleaner does its job, the better you like it. That's why the new Imperial Rapid Brush Cleaner will make a hit with you!

Its powerful solvents cut right into hardened paint, varnish, lacquer, enamel or shellac in record time.

**No mixing** — ready for instant use.

**No washing or further cleaning** — once a brush has been cleaned with Imperial Rapid Brush Cleaner, it is ready for immediate use.

**Kind to any bristles** — contains no acid or alkali to rot bristles. And it will not hurt your hands, either.

Order a can of Imperial Rapid Brush Cleaner from your dealer now, or write us for information.

## LINGERWETT REMOVER

The most *economical* paint remover is the one that saves you the most *time* and *labor*. That's LINGERWETT—the most popular remover throughout the U. S.—as proved by leadership in sales!

With Lingerwett you can tackle any variety of finishes — paint, varnish, shellac, lacquer, enamel, wax — with the assurance that it will work equally well on all.

Its perfectly balanced formula prevents wax from being deposited on the surface; when the old finish is removed the job is absolutely clean—in perfect condition for the next finish.

For faster work, and true economy, standardize on Lingerwett.

## WILSON-IMPERIAL COMPANY, Newark, N. J.

### Casehardening Cracks

This is the oldtime varnish user's name for this type of check or crack, but the lacquer manufacturer recognizes them by the name of plasticizer cracks. Often they are caused by a poorly formulated or improperly balanced lacquer. The use of too much plasticizer in a lacquer will cause it to remain soft under the surface hardening, caused by the immediate evaporation of the volatile matter. This has the same effect as the presence of two films of varying degrees of elasticity, that underneath being softer than the surface film. As they expand they pass the expansion limit of the harder part of the film with accompanying breakage. As they develop they take on the appearance of loops or hooks, and are sometimes called hairpin cracks.

This same trouble is sometimes caused by failure to permit the undercoats to dry properly before the next coat is applied, and as the undercoat gradually dries it shrinks in volume, and as the top coat is already dry it must "give" when its expansion limit is reached.

A safe remedy for this trouble is to make sure that each coat is thoroughly dry before succeeding coats are sprayed.

### Old Age Cracks

This is a trouble for which furniture manufacturers cannot be held responsible, only insofar as they use finishing materials that will stand up under long service. It is more common with varnish than with lacquer and is simply the natural process of wearing out.

Usually old age cracks have an "alligator" appearance, but are rounder and smaller than overcoating or casehardening cracks. This type of crack requires very little comment. In varnish, the film has reached its capacity for oxygen absorption; the oil has completely oxidized and there is no resiliency left. In the case of lacquer, the film has tightened up until it can contract no farther, and must break.

### Treating Cracked Finishes

But, in addition to knowing the causes and how to identify the different types of checks or cracks, the finishing foreman is interested in how to refinish the pieces which have already cracked, and to avoid any re-occurrence of the trouble.

Generally, it is best to strip the finish down to the bare wood, but in many cases this is impractical owing to the difficulty in matching absolutely the original staining, toning, or high-lighting. If the piece is a part of a set, it must absolutely match the remainder. In such cases it is preferable to proceed in such a manner that the stain will not be affected; in the case of lacquer this is not at all difficult.

The best method is to spray two or three coats of lacquer thinner on the piece in mist coats, taking great care to avoid putting on enough to raise the old finish in blisters. Sometimes rubbing the old finish with a soft cloth moistened with thinner will remedy this trouble at once; the lacquer film will absorb part of the thinner and flow together into an unbroken film.

When more action is required after the thinner has been sprayed and is thoroughly dry the cracks may be sanded lightly with fine sandpaper. Then the surface should be thoroughly cleaned of dust, and two or three coats of wood lacquer applied. The first

HILO

ANNOUNCES

# HI-FLEX *Synthetic*

## A New Industrial Air-Drying Finish

HI-FLEX *Synthetic* is a new Synthetic Air-Drying Finish of remarkable toughness and flexibility, developed by the Hilo Laboratories.

Finishing Departments charged with the responsibility of economical production plus finished good appearance and salability of product, will be interested in this new development.

HI-FLEX *Synthetic* is applied by Spraying or Dipping. It dries with the speed of lacquer. It hides completely in one coat. The film produced has the body and fullness of an oil enamel, the durability of a high grade paint and a hardness and gloss closely approaching porcelain. It will not chip or crack — *it is highly flexible.*

HI-FLEX *Synthetic* adheres firmly to wood and metal. It is waterproof and withstands outside exposure. It retains its color and lustre.

HI-FLEX *Synthetic* will prove a boon to makers of products whose characteristics preclude a baked finish, and to plants wherein oven equipment is not available.

A request on your letterhead will bring you Color Chart and full particulars about the new HI-FLEX *Synthetic* Air-Drying Finish.

**HILO VARNISH CORPORATION**

*42-60 Stewart Avenue, Brooklyn, N. Y.*

CHICAGO : PHILADELPHIA : BOSTON

*Makers of Fine Industrial Finishes Since 1863*

coat should be reduced sufficiently and sprayed so lightly that there will be no danger of raising the film, but the following coats may be applied full body as in the ordinary course of work. Thus the old film has been moistened by the thinner and the first coat, and since lacquer contracts in drying, the cracks will pull together and disappear. The cracks will be visible while this work is first in process, but when the lacquer dries the cracks will close up.

The advantage of this method over stripping is that there is no change in the original color, as might be the case if an attempt were made to match some special shade or tone. Of course, if the cracks are too large and numerous this process will do no more than reduce their size; a strip job is the only recourse.

With varnish cracks, however, because of the difference in its composition and drying, the only way to remove cracks or checks is to clean off the piece and start over, despite the fact that some finish manufacturers have marketed products known as "crack amalgamators" or "crack fillers." So far as I have been able to test and prove these materials out, none have been satisfactory for a first class job.

Everyone knows the old saying about "A stitch in time . . . ;" the finisher who thoroughly understands the reasons for cracks and checks showing up is far along to the point where his work will never be troubled by them.

## Even-Flow Compressors

Most of us are pretty well acquainted with the principle of operation of the air cylinder, where the pistons "work stroke" depends upon which end of the cylinder receives compressed air. When it comes to air compressors, we have a principle which is diametrically opposed, since here the pistons are powered by a motor or engine, and then do the compressing. But I had never known of a case where a compressor piston was arranged to produce an even flow of compressed air by causing it to compress air on both the forward and the backward stroke. Now, however, it appears that this has been very successfully done in the design of a piece of paint-spraying apparatus that has made its appearance. Another oddity, as regards previous practice, is the fact that the cylinder oscillates backward and forward.—J. E. H.

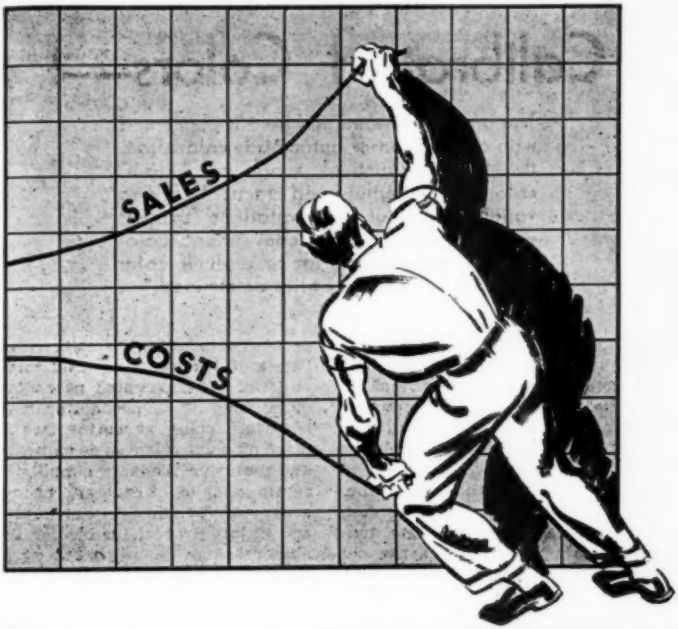
## Alsop Expands Service

To give the same quick and thorough service in all parts of the country as it has given in its home territory, the Alsop Engineering Corp., (Equipment for Liquid Processing), 39 W. 60th St., New York City, has for the last six months been developing its organization until it now has available trained representatives at 13 strategic points—Baltimore, Boston, Chicago, Cincinnati, Connecticut, Detroit, Kansas City, Los Angeles, Newark, Philadelphia, Pittsburgh, St. Paul, and San Francisco.

The Alsop organization policy has always been based on the fundamental dogma that while sales and profits are the ultimate goal, they can only be reached by unselfish service in every capacity, regardless of immediate sales prospects.

Following this aim the company has found itself elevated to a leading role as consultants and advisors in anything pertaining to liquid processing. This Alsop experience in all phases of liquid processing is now instantly available all over the U. S. through the trained force of district representatives.

All who are interested in modern liquid manufacturing methods may now call upon the Alsop local representative, who is ready to render any possible service without obligation and solely on a future goodwill basis.




# Is your FINISH doing its share?

This thin film of *finish*—is it *working* for you? Is its color right? Does it *look* like quality? Or will it scratch, mar, and wear quickly? Can it peel off? Is it costing you too much?

Are you *sure* of these things?

Until you watch actual people really buying your goods, you can't appreciate the vital importance of FINISH. It can make or break the sale.

Egyptian has for years been making fine finishes that *help* sales. They please the undecided eye. Once in use, they *hold* good-will.

Back in your factory, these same finishes often reduce finishing costs materially.

Call up the Egyptian man and let him size up how *your* finish can work harder for you.

**THE EGYPTIAN LACQUER MFG. CO.**

**90 WEST STREET · NEW YORK CITY**

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# « Calibrated Colors—I »

**The proposition outlined here is concerned with a reduction of automobile colors from the vast, impractical range of 11,500 colors to a complete and practical working variety of about 290 variations. Explicit symbols replace vague, conventional color names, and a greater range of finer color harmonies can be easily determined.***

THE PREPONDERANCE of automobile color variations, totaling 11,500 today, and increasing at the rate of approximately 800 new developments each year, is brought about largely by the car builders' acceptance of off-colors. The automobile manufacturer is obliged to select suitable colors for appropriate harmony from a vast array of unorganized colors. Most of these colors cannot be made readily available for inspection because of the tremendous cost of carrying samples.

In many instances color standards have been carried by lacquer manufacturers for a year or more without a single gallon order having been entered for the color. In view of the disturbing fact that the suppliers' color standards, retained as guides in preparing each batch of color as it is ordered, change color because of chemical reaction, it is exceptionally difficult to correct and keep constant in color a color range of such stupendous magnitude.

So long as automobile manufacturers are content to accept off-color shipments from suppliers and to adopt these color "drifts" as new standards, the color situation will become more and more chaotic. The accepted procedure of starting off in production with a certain color, accepting two or three off-color releases as standard and requiring the color supplier to retain samples of each succeeding accepted off-color as a new standard is largely responsible for the current situation. As many as 80 variations of one original color exist, to cite an extreme case. This situation is aggravated still further where motor car manufacturers switch a color around from one supplier to another. This procedure is one of the most productive means of establishing added colors.

### Five Principal Hues Are Basis of New System

To help overcome some of the many disadvantages arising from the automobile color setup as it stands today, the Duco Color Advisory Service, after a careful investigation of the many existing color systems on record, offers a series of colors called, "Duco Calibrated Colors." There are approximately 290 colors in this series and these colors represent an extremely close approximation of every conceivable color or color

*Duco Color Advisory Service.

arrangement required for automotive work. The success of this new system in effectively overcoming the disadvantages of the old is largely dependent upon the manner in which the 18 representative automobile manufacturers who have studied the application of these calibrated colors live up to the spirit of their acceptance of this color series and refrain from reverting to their old practice of allowing off-color once again to dominate the situation.

If pigments of a purity comparable with sunlight were available to the lacquer manufacturer, then a system of automobile colors could be built around a triad of fundamental hues comprised of red, green and purple blue. Until pigment purity attains this perfection, five principal hues—red, yellow, green, blue and purple—are required as a basis for this new system. The intermediate and secondary intermediate colors employed in the series are based on these five key hues. Intermediate hues, made from mixtures of the five original color families, are yellow red, green yellow, blue green, purple blue and red purple.

The secondary intermediate range of hues completes the circuit of hues by representing, together with the two hue classifications already referred to, every color family at its fullest hue strength. Red yellow red, yellow red yellow, yellow green yellow, green yellow green, green blue green, blue green blue, blue purple blue, purple blue purple, purple red purple, and red purple red are the secondary intermediate colors and complete the hue circuit, and all of these variations are adequately represented in the series with exceptions noted in the following.

Owing to the fact that certain durability limitations must be observed in order to present satisfactorily colors of sufficient stability for outdoor exposure requirements, four of the 20 hues, comprising a portion of the color circuit (purple, purple red purple, red purple, and red purple red) have been withdrawn from consideration.

### Color Dimensions—Hue, Value, Chroma

Each durable color family or hue retained in this new color system has been subdivided into color dimensions called "value" and "chroma." Until January, 1932, little was known about chroma in automotive art and color departments. Hue (the quality by which red is distinguished from green; purple from yellow, etc.) and value (the lightness or darkness of a given color) constituted the only known dimensions with which color was described in the automotive industry. Light values are sometimes called tints, and dark values are known as shade. In this new series of calibrated colors, the lowest or darkest value is black, and is represented by a notation of triple zero (000). White, the lightest or highest value, is represented by 9. Between these two extremes of value, there have been developed ten visually calibrated neutral sequences from dark to light, designated in this order by the following symbols: 00, 0, 1, 2, 3, 4, 5, 6, 7, and 8. These 12 neutrals are one dimensional; that is they lack hue and chroma characteristics.

By actual count, 413 so-called gray colors have been formulated to meet automotive production "needs." It is proposed that this entire cumbersome series be replaced by ten neutrals ranging between black and white. Blue

grays, green grays, warm grays, and the like are merely extremely weak chroma variations of the blue, green, and red color families.

In much the same manner as the size of a room can be described in three dimensions—length, width and height—so, too, can color be adequately portrayed by a use of the three recognized fundamental color dimensions—hue, value and chroma. Chroma expresses concisely the third dimension of color. Chroma is the degree of departure of a color sensation from neutral. An olive green is a green of exceedingly weak chroma. An emerald green is described as possessing strong or powerful chroma.

### Designating Color by Dimension

By the general adoption of these color terms in the automotive industry, it will prove possible to describe and convey impressions of colors most accurately. In place of attempting to describe "Powhatan buff" by saying it is sort of a deep, dusty, muddy, yellowish kind of brown, we can call its appearance vividly to the mind of one familiar with these color dimensions by saying it is a yellow red yellow at three steps of value and one step of chroma. This means that it is a yellowish brown of low middle value, lacking brilliance or purity. The color we call brown does not appear in the spectrum. Brown is, however, a low value of yellow red or yellow red yellow. If it is a yellowish hue of brown, then it belongs to the yellow red yellow hue.

Because of the tendency, in the past, to permit color development to proceed along lines of least resistance, the range of colors carried as standard by various representative color suppliers lacks completeness, orderly arrangement by color group, and the appeal that a complete range of strong chroma representations would add to any color line. The new range of 290 colors embodies all of these advantages and in addition is a time saver to those whose work is to select effective production color schemes.

### Number of Active Colors

A special survey of color gallonage statistics recently completed by the Automobile Color Index, with the cooperation of automobile manufacturers, reveals the interesting disclosure that not more than 200 color variations have been employed in production in any one month. When we consider that the peak production months of April and May of 1928 and 1929 are included in this picture, the amount of surplus in 11,500 colors can be readily imagined.

There is a column containing a list of colors called "leaders" which appears each month in the Automobile Color Index. This column lists colors of such great consumer acceptance that they are considered fashion colors. A survey of the colors that have appeared consistently as leaders during the past 4½ years discloses that a range of a few distinctive colors of representative hues have remained consistently in favor all this time.

It would not be practical to arbitrarily select 290 of the most popular colors from the extensive existing color range because such a selection would by no means be as representative of all color variations as a calibrated color range especially prepared to provide a complete outline of distinguishable colors in the most desired variations of every durable hue.

When colors are systematically prepared to represent every full

# HUGE VOLUME SLASHES COST OF AMBERRY WHITE

Thanks to the huge amount of Amberry White now used by American industry, this once very costly enamel finish is now extremely moderate in price.

Amberry White is the closest existing approach to porcelain itself—*and is actually whiter.* It either air dries or bakes extremely hard, and possesses a beautiful, enduring lustre.

One prominent manufacturer, who now uses Amberry, reports a 70% reduction in finishing costs over previous methods and materials.

Whether you manufacture tacks or locomotives, buttons or washing machines, Amberry enamels, in a wide range of smart colors, will give your products greater durability and distinction at less cost . . . . Write for the facts.

**BERRY BROTHERS**

PAINTS - VARNISHES - ENAMELS - LACQUERS

DETROIT, MICHIGAN WALKERVILLE, ONTARIO

strength color group in its entirety of variation, it is a relatively simple procedure, in the event a green of yellowish hue is required, to select from the yellow green yellow or green yellow color families the exact color desired. If it is a dark color, it will be found among the low values; if a bright color is needed, a sufficiently bright chroma will be available.

### How the System Works

The measured steps of value and chroma are sufficiently far apart to provide adequate contrast one with another. In this way, a car body finished in two steps of chroma will contrast effectively with fenders and moulding in the same hue and value at three steps of chroma. With calibrated it is possible to secure as many as six good color schemes from four colors of a single hue. With four blue purple blues, for example, blue purple blue 43, blue purple blue 42, blue purple blue 32, and blue purple blue 33, we find the first two variations contrast in chroma, as do the second two. The two end colors and the two middle colors contrast in value, and blue purple blue 43 represents a value and chroma contrast with blue purple blue 32, as does blue purple blue 42 with blue purple blue 33. In this way, by stocking only four colors, a car builder has recourse to six practical color combinations.

Another practical virtue of colors arranged systematically is the protection afforded from obsolescence difficulties. With calibrated colors, it is a comparatively simple matter to alter any color in any hue by adding another color of the same hue, providing the color added differs in value or chroma or both. By adding an equal amount of a color's complement, at the same value and chroma, a neutral may be obtained. Unequal proportions of base color or complement produce good grays of slight hue characteristic, dependent upon which hue predominates. For example, purple blue mixed with yellow, with purple blue predominating, would make a warm bluish gray.

*(To be continued)*

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A new flexible air-drying finish is said to wear "as if it were part of the metal itself."

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## James B. Day & Co.

Thomas E. O'Connor, who has been in charge of enamel formulation and production for James B. Day & Co., Chicago, for the past two years, has taken over the lacquer department as well. Mr. O'Connor has had an extensive experience in the formulation of all types of nitrocellulose lacquers, and is now working on several new items.

---

## E. I. du Pont de Nemours & Co.

The Chemical Specialties Division of E. I du Pont de Nemours & Co., which handles the sale of No. 7 polish and other No. 7 products, and the Refinishing Division, which handles the sale of Duco for refinishing, are being moved on November 1 from Detroit, Mich., to the Du Pont Building, Wilmington, Delaware. The company will continue at Detroit, however, its head sales office on automotive finishes sold to the car manufacturers.

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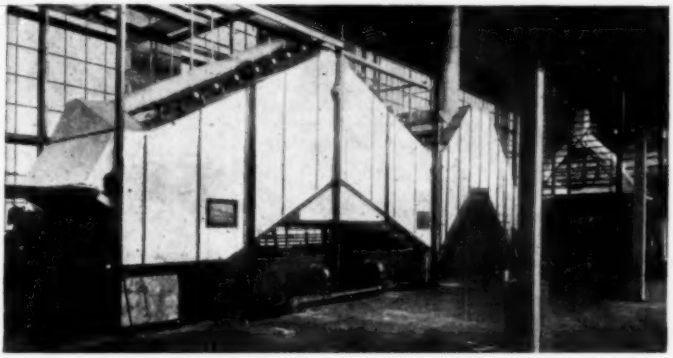
## D. S. Smyth, of Spruance, Dies

Douglas S. Smyth, vice-president and superintendent of The Gilbert Spruance Co., Philadelphia, widely known in the wood and industrial finishing industry, died Sunday, October 16th, in Bryn Mawr Hospital, Bryn Mawr, Pa., after a two-month's illness.

Mr. Smyth had been associated with the company for 13 years, beginning his activities with it in 1919 as Chief Chemist, having previously been connected with the Jamestown Wood Finishing Co. of Jamestown, N. Y. Forty years old at the time of his death, he is survived by his widow, one son and father.



# Oven Temperatures Affect Finishes » »

by W. W. King

The Ault & Wiborg Varnish Works, Inc.

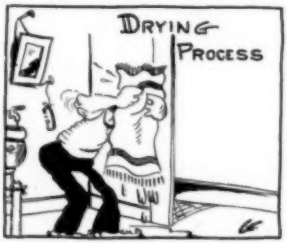
A glimpse of bake-finishing practice in industries that manufacture bottle caps and tins for food products.

THE demands by packers of all kinds of foods and beverages for a lacquer or varnish to withstand the chemical action of these products when sterilized as high as 260°F. has forced varnish manufacturers to lay down specifications for baking these products that will permit them to maintain results in various plants that will conform with the laboratory tests of the material.

The formulation of a successful lacquer means one that must fit into the production schedule of a can or cap manufacturer, because mass production and extremely low unit cost are necessary in this business. It is seldom that the same lacquer for the same purpose produces the same results in separated plants or organizations. Obviously, differences in application and baking are the reasons. In the transition from the liquid lacquer film to the finished film of hard durable lacquer there are both chemical and physical changes. The extent or

degree of these changes is definitely controlled by the time and temperature characteristics of the particular oven used.

The temperature of the ordinary type of continuous oven is usually measured by two thermometers or recording pyrometers placed one-third of the distance from each end of the oven. Whether it is a "direct-reading bulb" type, or "recording resistance" type, the temperature measured is that of the air surrounding the bulb or coil and it is decidedly not the temperature of the surface of the tin. There is a relation between the two temperatures, but it is by no means constant enough for uniform results. Furthermore, the temperature of only a few inches in a total of perhaps 85-ft. of oven is measured. Any temperature may exist in the rest of the oven, and charts show this to be the case.




In order to determine the surface temperature of the actual tin plate going through for each foot of travel, I made up a special oven-testing outfit which gives exact information. Five thermo-electric junctions were soldered on the corners and center of a sheet of tin, which was placed in an empty rack and passed through an oven with a full load of coated sheets ahead and behind. The leads or wires from the junctions were carried out over the tops of the other sheets and attached to a specially compensated potentiometer. This was calibrated to show the actual temperature of each junction, reading to intervals of 2½°F. directly and to ½° by interpolation. A rotary switch enables an ordinary operator, by cutting in one thermo-couple at a time, to make five readings in less than half a minute, thus establishing the exact temperature at that point in the oven, for the center and each corner of the sheet. A series of such readings at one-minute intervals gave a continuous record of the oven temperature, showing high spots, etc., and a chart was made to correspond.

After a test has been run with this outfit, the oven exhaust drafts and gas flames may then be adjusted to produce a uniform heating curve throughout the oven. Such charts will furnish information which, if it is acted upon, can lead to an improvement in the atmosphere in the room by better removal of fumes, and can effect a reduction in gas consumption by proper adjustment of the burners. As desirable as this may be, the importance of a definite knowledge of the temperature and time of baking on the tin surface is far greater.

When the lacquer manufacturer is told that his product is to be coated on tin and heated for 19 minutes at 380°F., he knows this is but an approximation and he must design his lacquer to conform to what he believes will work in this oven. Usually, he must play safe and use such gums and driers as he hopes will be satisfactory, but even a long experience will not enable him to do more than guess at it. He may have to try a number of times; the

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**LIGHT-FAST**
(FAST-TO-LIGHT)
**LACQUER SHADING STAIN**

Does not bleed or fade. DRIES INSTANTLY. Made entirely from water colors assuring fastness to light and non-bleeding. A perfect blending and shading medium. May be used either directly over filler or between sealer and lacquer coats.

**WATEROIL STAINS**

#1900 Wateroil Rubbing Oil.

Quick Drying Fillers, Lacquer Shading Stains, Finishing Waxes, Lacquers, Sealers, Drawer Coaters, etc.

*"UNQUESTIONABLE QUALITY"*

WOOD FINISHING SUPPLIES

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**HARDWARE LACQUER**

Leading hardware manufacturers have for many years preferred M & W metal lacquers because they *are economical, run uniform in quality, preserve the finish longer, and wear better.*

**HB LACQUER**

The standard of Quality in the hardware trade.

**SS METAL LACQUER #49**

Effectively meets the problem of "Spotting Out."

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**1115 W. Washington Blvd.**

**Los Angeles Office & Warehouse**
**2416 Enterprise Street**

original misinformation is a constant source of trouble, not only with samples, but in the continued use of a tested product that has gone wrong because of a change in oven conditions that two isolated thermometers cannot show.

The calibration of one oven at three different nominal temperatures can be made in a morning or afternoon without interfering with production in any way, and the expense of instruments and time would not be nearly as great as the spoilage which might be caused in the wrong handling of 25 gallons of material. In other words, it is a service that will protect both the user and the manufacturer and should be taken advantage of promptly. The equipment is portable, accurate and can be operated by any foreman with a few days instruction and practice.

## Synthetic Enamels for Oil Burners

A DURABLE and attractive finish for parts used on oil burner heaters can be produced with synthetic enamels. Care should be taken that all parts are free from dirt, grease and other foreign matter. Castings should be sandblasted with fine sand if possible. If this process of cleaning is not convenient a thorough scratch brushing will do a reasonable job of removing molding sand, facing, etc., from the castings.

Sand and blow holes and other surface imperfections should be knife-filled with a suitable filler. After drying thoroughly the filled places should be sanded to an even surface with a reasonable fine grade of wet-or-dry garnet paper. Clean off the dust and spray on one coat of synthetic enamel of the desired color. Orange, yellow, jade green and red are some of the colors being used.

The synthetic enamels have strong adhesion, one-coat coverage producing a tough elastic surface which air drys in less than an hour. For a more flexible finish, I advise the grade that is designed for a baking schedule up to 200°F. for 30 to 60 minutes. State your preference when ordering.—G. E. JOHNSON.

Adjustable paper funnels, which come flat, are now offered—"a fresh individual funnel for each job."

VARSEAL
THE LATEST THING IN SEALERS
Equally Satisfactory Under Varnish or Lacquer
A Distinct Saving Over Shellac
THE GILBERT SPRUANCE CO.
Richmond and Tioga Sts. Philadelphia

# Questions; Answers

« « « » » »

## Laying Gold Leaf

We wish to inquire if you can give us information with reference to laying gold leaf on white enamel over wood. What we would like to have is a complete schedule of the entire operation; the preparation of the size, the testing of the size for correct "tackiness," putting on the size, laying the gold and cleaning the gold.—T. T. Mfg. Co. (Church Furniture)

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In discussing gilding we must bear in mind the two classes of gilding sizes which are commonly used, namely, "quick" and "slow" sizes. Quick size, as generally accepted, consists of a good grade of gold size japan, and when practical, it should be used straight from the can, although at times it may be necessary to add a little rubbing varnish or even finishing varnish to slow it up; or a little color to allow the user to better see where he is applying it. This is especially the case on ornamental or line work. Perhaps occasionally a little turpentine may be added to make it work easier, but it is the right "tack" that counts.

The coat must be full and round and evenly distributed. Gold should not be applied until you can lightly press the tip of your finger to the sized surface without leaving an imprint.

On most work of this type, gold is applied directly from the book. The leaf of the book is folded to width required, the finger nail is run over lightly on gold and then the book is pressed on sized work. Gold can also be taken up (after cutting with the finger nail) on a gilder's tip and applied to sized work; or a gilding pad made of sheepskin may be used to lay one or more leaves of gold on, and with a long keen knife you may cut the gold to size wanted; then, with the gilder's tip, pick it up and apply to sized surface.

There is also a so-called "patent gold" which is attached to a wax paper; this enables a workman to handle the gold easier than from loose leaf books, but except for outside work, such as store fronts, showcases, etc., it is not very good. You do not get the burnish with this way of handling gold leaf.

Still another way of applying gold is to use the gilding wheel. This means of gilding is very popular in railroad shops where the lines are of only one to two widths; likewise the lettering is of a uniform size and style.

### Gold for Lettering

On commercial body and bus lettering and striping the ribbon gold is popular. By taking a ¼ or ⅜-in. wheel, one in each hand,

a skilled workman can do as much gilding on the average striping and lettering job in two hours, as he could in a day, off of the book. Since this work is all done with quick size and afterwards varnished, he can let his size reach just the right point before applying gold leaf, as pressure of the wheel helps him, so the risk of tearing up gold either under a brush or spray is greatly reduced.

Occasionally the so-called "slow size" (fat oil) is used in every branch of the painting trade; it is popular in sign painting shops, and for outside signs it cannot be replaced.

In this work cleanliness is important—a clean surface, clean materials and clean tools. Size is applied with a camel-hair brush in a flowing coat. Gold is cut on book with the finger nail, and applied to the size with a gilding tip. If the size is "right," when gold leaf on a tip is held within ¼-in. of the surface to be gilded, the gold leaf should jump off the tip and onto the size.

Before the days of "Volstead," this could be easily managed by adding some pure grain alcohol to the sizing. This helped to attract the gold leaf and it acted as a preservative. However, suitable commercial sizes will do the trick if used as directed. The object, of course, is to put the gold in place without letting the tip come in contact with the size—so as to always have a clean dry tip. It is well to have several tips for this work, and since they come in different length hairs, it is advisable to use one best suited to job at hand.

### Monograms and Emblems

Decorators, working in distemper colors, use the yellow of an egg tempered with a few drops of glycerine. The more glycerine the slower the size dries. Sometimes on large fields, such as shields, etc., the design is given a coat of thin shellac to stop suction. Then the old fat-oil size is generally used, care being taken to avoid letting the size go quite to the edge of shellaced surface.

Often one is called upon to do a job of gilding on a newly varnished surface; perhaps it is a monogram or trade mark on a vehicle door. Naturally, gold leaf would stick to a surface not treated with whiting, but if a coat of the white of an egg is applied, or if the surface is lightly rubbed with the inside of a white potato, it will stop sticking; when the job is completed the surface can be washed and all traces of either method used may be removed.

### Furniture Gilding

With present-day styles in furniture the decorator is coming into his own, so naturally we may expect to see more gold leaf used.

With so much open-grain work, you will find that lacquer makes an ideal preparatory coat for this type of gold leaf gilding. One or two thin coats will stop all ab-

# IMPERVIOUS
## FINISHES

*For Industrial Use*

Pyroxylin Lacquer
Finishing Varnishes
Synthetic Enamels
Baking Enamels
Primers and Surfacers

## IMPERVIOUS VARNISH Co.

KOPPERS BUILDING PITTSBURGH, PA.

## PRESDWOOD AND CELOTEX FINISHES

Four years of careful and intensive research have gone into our perfected system of lacquer finishes for Presdwood and Celotex.

These extraordinarily adaptable surfaces are becoming more and more widely used in industry. Their finishing presents certain definite problems - we have the answer.

Makers of tile, cabinets, boats, toys, refrigerators and any other industrial production utilizing these boards, will find it profitable to consult us.

*Write for our new descriptive bulletin*

## THE VARNISH PRODUCTS CO.

CLEVELAND, OHIO

sorption and so hold out the size. One coat will protect the gold leaf.

Now if you will heed a "warning," don't use gold leaf too skimpily. Gild with a full lap and don't try to get the cheapest leaf on the market. There are standard manufacturers who make a quality product; patronize them. If you are going to gild on glass, get gold made and sold especially for that type of work. If you are going to gild outside, get a patent or storm gold, and the best of this kind; the same with loose gold or ribbon gold. Fifty cents or a dollar saved on a pack of 20 books, 500 leaves, in this more than many other things in the trade, is poor economy. The same applies to size. Given a fair chance, gold leaf will outwear any article used in our trade.—A. F. E.

## Tumbling Square Blocks

Referring to an item under the above title in the Questions and Answers department of the October issue, (page 32), I feel sure that with proper care and attention a satisfactory finish can be applied to these blocks by the tumbling process, without wearing off any great amount of the sharp corners. I suggest the following procedure: Stain the blocks with non-grain-raising stain, using a wire mesh basket to dip them in bulk. After the blocks have been dipped in the stain and then allowed time to dry thoroughly, place them in the tumbling barrel. Fill the barrel to within 6 or 8-in. of the loading door; this will allow the blocks to tumble together and not drop far enough to cause bruising or any excessive wear on edges. Let the barrel rotate 40 to 50-r.p.m.

For finishing material I suggest a 4-lb. cut of white shellac reduced 50/50 (equal parts) with denatured alcohol. For a 50-gal. barrel, make about four applications of 16-oz. per application, allowing 20 to 30 minutes between applications or letting the barrel rotate until each application has tumbled dry.

To prevent blocks from sticking together put in three or four quarts of small round or irregular shaped turnings. Next remove the blocks, spread them out on a wire screen and allow them to air dry five or six hours. Next put them back in the barrel for polishing. For this operation put in 20 or 25 pieces of carnauba wax, each piece being about the size of an English walnut; also, put in five or six handsful of clean scrap leather and allow the contents to tumble until you obtain a polished surface, which will be in a short time.—J. E. Greene.

Dependable Industrial
FINISHES
Varnishes — Paints — Enamels
Japans — Stains — Lacquers
Special Finishes — since 1865
THE CINCINNATI VARNISH CO.
Division of The Fay Paint Co., Inc.
Cincinnati . . . . . Ohio

A ONE-COAT spraying enamel that bakes or air-dries to a smooth hard glass-like finish is now available in various colors. It forms a tough elastic film which resists abrasion. . . . does not chip nor mar readily. . . .does not "orange peel" or "paper print."

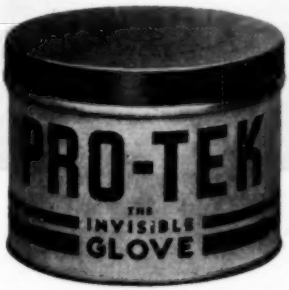
# What's New - -

« « » »

## Protects Workers' Hands

For years men who work with such stubbornly adhering materials as lacquer, paint, varnish, grease, oil and similar materials have faced a serious problem in cleaning their hands. This has lead to the use of solvents and harsh abrasives which in themselves may be harmful to the skin. Now, for the first time, protection from such stubborn materials and from the use of abrasives is available in Pro-Tek, a new product being marketed by The DeVilbiss Co., Toledo, Ohio.

Pro-Tek is a white cream which, when rubbed into the skin before working, forms a protective film, soluble only in water and, which




A full day's protection for the hands costs less than half a cent

sticky substances and soiling materials are powerless to penetrate. Pro-Tek is revolutionary in action, being the first material that actually prevents dirt and liquid from entering the pores of the skin. Hence, it justifies its description as "the invisible glove." Pro-Tek is not only harmless to the skin, but actually beneficial. In addition, it leaves no sticky or greasy feeling.

When Pro-Tek is used, lacquer, paint, grease, metallic dusts and similar materials can be quickly and completely removed by washing the skin under running water. This has been conclusively proved by tests of the severest nature. In these tests, men have applied Pro-Tek and then dipped their hands in black lacquer and let it dry, or coated their hands with oil, or soiled them with printer's ink. In every case the material was easily removed by water. Even battery acid, gasoline and naphtha are unable to reach the skin through Pro-Tek. Hence, workers who have always had dry, cracked or stained hands can now keep them soft and healthy through the use of this new material. In addition, it is helpful in preventing oil dermatitis and other industrial skin diseases.

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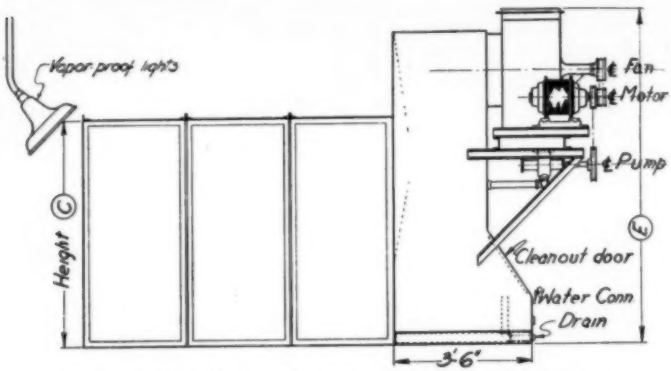
## Hydro-Filter Spray Booths

The R. C. Mahon Co., (spray booths, exhaust systems, drying ovens), Detroit, Mich., announces a new development in spray equipment—a firesafe, hydro-filtered spray booth. Through operation of the hydro-filter in this booth all pigment, dust and other matter, which normally collect in the fan and exhaust duct are removed from the exhaust air by the hydro-filter process, eliminating any possibility of danger from fire or explosion. The hydro-filter process eliminates the pigment from the exhaust air and




Side view of hydro-filter Spray Booth equipped with high-pressure water jets.

carries it to a separator where it can be reclaimed.

The outstanding feature of the hydro-filter booth is an ingenious arrangement of water spray, from high pressure jets, operating in conjunction with specially designed baffle plates.

Proper ventilation is insured by a constant suction draft produced by a direct fan. The necessity for a sprinkler system in exhaust ducts is eliminated due to the removal of combustible properties from the exhaust air. The need for running stacks outside of the building is also eliminated, and as a result the tremendous heat loss caused by the natural draft common in all vertical stack installations is avoided. The use of the hydro-filter booth permits the use of small discharge piping to the outside of the building. Batteries of two or more spray-booth units can be combined and operated by one fan.

The Mahon hydro-filter spray booth provides double protection against dangerous explosions and fires in the exhaust system. First, all combustible matter is removed from the exhaust air before it enters the fan or exhaust ducts—the fan and ducts are always clean. Second, it is impossible for a fire, generated inside the booth, to pass through the hydro-filter chambers and spread through the exhaust system—the fire is confined to the booth until it can be extinguished by regular fire-fighting equipment.

Insurance men have enthusiastically endorsed this new type spray booth as an outstanding achievement, and a positive safeguard against the ever-present danger of explosions and fires—particularly in plants where spray painting nitrocellulose finishes is an important part of production.

## First Tung Oil Paint

The O'Brien Varnish Co. announces the completion of three year tests of a new paint made with tung (or China wood) oil as its vehicle (rather than linseed oil), the only paint of its type made on a large scale in America.

In these tests this new paint has shown almost revolutionary durability and ability to hold its original luster and tint—and real washability after exposure.

Likewise its original appearance has been extraordinary—great depth and purity of color, unusual enamel-like ability to lose brush marks and level out smooth, excellent luster.

Tung oil has preserved the huts

# 2 Superior SHEETS

**SUPER GALVANNEALED** and **SUPERIOR SUPER-METAL** are unusually high grade steel sheets, so similar in general characteristics that they may be considered as two grades of the same material. They are recognized as outstandingly superior for every type of sheet metal work wherever weather and other corroding conditions are unusually difficult.

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## The SUPERIOR SHEET STEEL Co.

Division of Continental Steel Corporation CANTON, OHIO

*Manufacturers of: Black, Galvanized, Long-Terne and Special Coated Sheets, Roofing and Kindred Products; Billets, Rods, Wire, Nails and all types of Fence.*

Superior Galvannealed

1. Highly Rust Resisting and the zinc coating will not chip, flake or peel.

2. Has an etched surface - - takes paint, lacquer andenamelfinishes, without special treatment.

"Superior Super-Metal" PATENTED PROCESS

3. Soft and ductile - - withstand severe forming operations.

4. The zinc coating is fused (bonded) to base metal.



## The TAYLOR SYSTEM of COLOR HARMONY

COLOR HARMONY exerts a powerful influence on sales of finished articles— . . . and the Taylor System of Color Harmony solves the problem of selecting color combinations easily, quickly and always harmoniously. This system is based on fundamental, natural color laws, but is reduced to such simple chart form, that anyone can readily understand and use it—there are no books to read—it's right before you in color. No waiting. No guessing. You simply select the base color for your scheme and the Taylor Keyboard automatically shows all the colors that harmonize with your base color. *Discords of color cannot appear through the mask.*

Chart "A" of the Taylor Color Harmony Keyboard is 22 x 15 inches and shows 96 different colors. It is accompanied by two black cardboard masks which can be adjusted to show four different tones of each color. Price $5.00.

**Practical Publications, Inc.**

802 Wulsin Bldg., Indianapolis, Ind.

and palaces of China for centuries, has waterproofed the Chinese fishing junks that are built to stand the monsoons of the China Sea for generations without replacement. For many years it has lent its remarkable properties (in small quantities) to American spar varnishes and marine enamels.

Its use in outside paint has been made possible by a new treatment for the raw oil which the O'Brien Varnish Co.'s chemists developed four years ago.

Incidentally, this development goes hand in hand with the development of a new and extremely promising American industry, the successful growing of tung oil trees in Florida and the Gulf States. Over 500,000 trees are in cultivation there now, and it is estimated that when this industry reaches maturity, there will be sufficient demand for the American oil (in place of the present Chinese supply) to require 500,000 acres of Tung Oil orchards in our Southern States—a tremendous new industry.

A detailed circular on this new paint, "Exterior Liquid Velvet," and other treated tung oil products can be had by writing to the Exterior Liquid Velvet (XLV) Department of the O'Brien Varnish Co., South Bend, Ind.

## Paper Funnels Handy

R. P. Cargille, 26 Cortlandt St., New York, N. Y., has brought out a line of paper funnels which come in the form of packages of flat discs about 10-in. in diameter, each paper disc having a 1-in. hole in the center, a radial slit and an attached brass clip which can be used to fasten the rim in position when the circumference is shortened to form a funnel of "lamp shade" shape.

The slogan is "A fresh individual funnel for each job!"

According to literature supplied, the use of these "Pennywise" paper funnels, "Avoids contamination from dirty funnels. Saves time, trouble and solvents required for cleaning. Especially useful for Paints, Varnishes, Lacquers, Oils, Tars, Asphalts, Adhesives and all gummy or viscous materials. Can be carried flat in brief case for field work."

## Goodrich Rubber Paint

A new line of rubber paints, which has been developed very recently and marketed in a quiet way, is thoroughly discussed in a recent bulletin of The B. F. Goodrich Rubber Co., Akron, Ohio.

Titled "Acidseal Paints" the bulletin is a manual of recommendations for paint problems and tells about rubber derivatives that minimize the corrosive action of acids and alkalies on materials.

These paints have as a base a commercial form of rubber isomer, developed by the Goodrich laboratories, which imparts valuable properties not found in ordinary paint films and characterized as follows:

1) Exceptional properties of adhesion when applied to a properly prepared surface.

2) Dry in one hour to a hard firm film but retain to a remarkable degree the elastic properties of rubber and consequently conform to the expansion and contraction of the support.

3) Retaining the well known chemically resistant properties of rubber, they provide a protective coating that minimizes the corrosive action of acids, alkalies and chemical fumes. Film is not water absorbent.

## *Permanent Restaurant Exhibit*

The American restaurant industry, third largest industry in the U.S. in number of units, and seventh largest in volume of retail sales, has selected Chicago as its permanent headquarters, with the establishment of the Restaurant Mart on the 17th floor of the American Furniture Mart, 666 Lake Shore Drive, Chicago. Beginning in 1933, every Fair will be held in the Furniture Mart and, in addition, many of the features of the Fair will become permanent, open to members of the restaurant industry the year 'round.

## Letters - - - - - -

*(Continued from page 8)*

coat various fabrics with lacquer preparations.—The Holliston Mills, Inc. (Makers of Fine Book Cloths) Norwood, Mass.

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## Cutters of Shellac

Will you please give us the names and addresses of several cutters of shellac?—Q. & C. Mfg. Co. (Stoves, Ranges, Furnaces)

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## Wanted in Mexico

Duties on paint and varnish removers are so high that this is an item which should be manufactured locally. Please, therefore, favor me with information as to the best formula for paint remover and varnish remover. Please also inform me the best way to wash wood after the varnish remover has been applied. Furthermore, kindly favor me with a good formula of a nitrocellulose lacquer remover.

I am a regular subscriber to INDUSTRIAL FINISHING. Is there any book published in the U. S. A. giving formulas for the manufacture of sundry products like plastic paint, removers, wood filler, floor cleaner, etc.?—M.H.H., Mexico City.

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## Mahogany Stain; Turnings

On page 22 of September issue, we read a very interesting article on "Mahogany Finish," and we would appreciate it if you would advise us where we can secure some of the mahogany stain referred to. We have a small wood turning, which we would like to stain or lacquer an attractive color, and would appreciate a reply at your earliest convenience. —D.F.F. (Advertising Specialties)

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## Band Instrument Finish

A few months ago we received from you some very good information on a polishing machine which is used for polishing musical instruments.

We are in the musical instrument business and lately we have been having a little trouble with lacquering finished instruments, such as brass, silver and gold.

Somewhere in this country there is a company that makes a lacquer or something very similar to lacquer which, when applied to any of the above finishes, makes a coating which is so durable that when handled by sweaty hands, or after lying in stock quite a while, will not tarnish. At the present time we are using two well known makes of clear lacquers, and we pay a very high price for them. In fact, the companies claim there are no better transparent lacquers made.

We again wish to thank you for helping us secure proper information on the polishing machine which answers our purpose satisfactorily and any information which you may give us in regards to a lacquer or finish that will prevent tarnishing will be appreciated.—X.Y.Z. Co. (Band Instruments)

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## Lacquer Fumes; Hunger Pains

As a reader of INDUSTRIAL FINISHING for the past few years, I find very little published about the effects of lacquer fumes on the worker. In spite of the fact that I drink plenty of milk, I experience a sort of hunger pain towards 5 o'clock, which I know is caused by lacquer fumes, as the pain disappears on my two days of rest.

I've consulted doctors but they don't seem to understand; they prescribe a change of occupation; as that is impossible at the present time, I would like to know what other spray operators do when troubled with their stomachs, due to spraying-room fumes.—Geo. Bensi.

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## Stripes Imitation Tile

In September issue, on page 4, I notice a letter, signed "T.S.Co." regarding striping for imitation tile. I happen to be the originator of the imitation of tile on both Presdwood and asbestos, and have several methods of making the stripes in any size or color. One method on which I have patents pending, is very simple. I have spent the last seven years finishing imitation marble and tile.

This method I use is adaptable not only for tile but for fancy borders and many other requirements. It not only makes the stripes but makes score marks without any cutting, and can be used on wood of any kind, Presdwood, metal, glass or composition, in any shape.—L.R., Los Angeles, Calif.

**Industrial Finishing**
MAGAZINE

Distributed to Executives and Foremen Finishers in industrial plants where finishing coats are applied with finishing equipment

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# EDITORIAL

## *Popular Finish Gets Attention; What Is Favored Now*

Commenting on "The Finish That's Popular," which appeared in this column last month, a manufacturer of finishing materials wrote us as follows:

"Might I suggest in line with the second heading in your editorial column in the October issue, that this might be elaborated on later to a great deal of avantage by saying something like this—

" 'Following up our thought of last month along the lines that what people want in furniture is appearance of age and use, and that in order to produce this, finishing manufacturers have developed some worth while effects.

" 'One finish manufacturer has developed a method of making very minute hairline cracks appear in the finished surface, either over a color or over plain wood in such a manner as to give the appearance of authentic age. This, of course, has nothing to do with the ordinary krakle finish that has been used for some time.

" 'Toning or glazing and other decorative work may be done either before or after this hair line is put in.

" 'The process is simple and comparatively inexpensive.'

"The above will give you an idea as to suggestions that might be used. What do you think of the idea?"

We think this is a good idea and right now we have ready for next month an illustrated article about "Antique Effects," where hair line and larger cracks are produced in finishes for furniture and other products.

## *Color Formulas; Color Matching*

Users of finishing materials, especially new users, feel the need for accurate and specific color data which will enable them to choose and use colors wisely, effectively and economically. It's important to be able to order, specify and match colors as accurately as one measures the dimensions of an object in inches and fractions. One angle of this subject is aptly and representatively expressed by a concern which writes as follows:

"We want to obtain one or more color charts which show, at the side of each color, a printed formula for that particular color, tint or shade to be produced from a few tinting colors—particularly in the case of lacquers. For example, we have in mind a stock of 10 basic colors or tinting colors which, when properly combined, will produce over 100 different shades of a large range of colors, or approximately 20 shades in each basic color. These tinting colors or basic colors are ready mixed to use in working out other formulas, and the prices and approximate coverage per gallon are given.

"We are interested in this arrangement for lacquers, enamels and wood stains, as we would then be in position to estimate the cost of producing matched colors without delay. We would know our material prices on the lacquer, enamel and stain, and we would be able to produce samples without delay, in the meantime ordering intelligently the proper ingredients required to produce the specific color or shade. If this system were standardized by all finishing material manufacturers

in wide enough range of colors (to be produced from a few basic colors) it would be a real service."

Some progress is being made in the adoption of specific standard colors and in the measurement of tints and shades produced by adding varying amounts of white for tinting and varying amounts of black for shading. This is an activity wherein progress depends largely upon the cooperation and coordination entered into by competitive concerns toward one common purpose.

## Action Ahead, Get Ready!

With the national election out of the way and with, we hope, the worst of the depression behind, industrial, commercial and business enterprises from the smallest to the largest are anticipating a gradual improvement in general activity. With this improvement will come what is needed most of all—confidence.

But a slow general improvement and a widespread feeling of confidence isn't in itself going to insure every concern the business that its owners or managers expect. The organization, whether small or large, must be tooled up and aligned to meet new conditions and requirements. Many drastic and far-reaching changes have taken place. What fitted into the picture effectively two or three or four years ago is now out of harmony with the new setup.

Executives have had to get into more intimate touch with all phases and details of their business and as a result they have injected some of that much needed spirit of pioneering, vigor and originality which really sustains a business in bad times and builds it in good times. In competition with these concerns that have been revitalized or rehabilitated, other firms which have simply waited for promised prosperity to return are going to be hopelessly out of date with their plans, designs, finishes, equipment, methods, overhead, buying, financing and selling.

## Improved Wood Stains

The raising of wood grain under the use of stains has for many years offered a field for research by finish manufacturers' chemists, and such research, until comparatively recently, has been ineffectual.

This was largely due to the fact that their principal efforts were directed toward finding a method by which they could retard stains containing a water vehicle, so they would eliminate this objectionable feature. Their difficulties in so doing were mainly due to the fact that certain indispensable aniline dyes were only soluble in water, and no other types of dyes could be found which were non-fading and fast to light.

But with the dogged persistency with which finishing research is carried on, they finally developed a thin, volatile vehicle which was entirely water-free, in which these anilines are soluble, and which gives the same amount of penetration as does water without raising the grain.

CLEANS, HEATS, HUMIDIFIES. A small portable unit now used in some industrial plants serves as an air cleaner, humidifier and heater. It removes 70% of the dirt and dust in the air, adds approximately 25% to 35% moisture to the air, and heats the air as does a unit heater.

## Color Value Layouts

BALANCE, not only in areas of color distribution, but in the actual selection of colors of appropriate value and chroma strength is essential if success is to be gained in color layout work. The eye adjusts itself readily to color areas comprised of low, middle and high values in combination and it is for reasons of symmetry and beauty in color layout that car color distribution in general is advocated in three values, distributed on cars in the following manner: Accent areas (window ledge moulding and stripe) in high value, strong chroma colors: wire wheels and sill moulding in middle value, weak chroma colors: body areas, fenders and sheet metal in low value, moderate chroma strengths. By selecting accent colors of adequate strength large areas of a subdued body color can be adequately balanced.—AUTOMOBILE COLOR INDEX.

## Direct from Calcutta

William Zinsser & Co. Inc., 516 W. 56th St., New York, N. Y., announces that they have been appointed as sole selling agents in the U. S. and Canada by Turner, Morrison & Co. Ltd. and Angelo Brothers, Ltd., of Calcutta, India.

Turner, Morrison & Co., Ltd. are one of the most important mercantile houses of the entire East. From them radiate lines of commercial interest that reach into almost every field throughout the world. They are one of the largest shippers of orange shellac gums to this country.

Angelo Brothers, Ltd. are the biggest individual shellac manufacturers in the world. They are the only concern making shellac on a quantity basis right from the sticklac to the finished shellac. And they have the only modern shellac factory in India.

## Industrial Chemicals

The American Cyanamid Co., 535 Fifth Ave., New York City, is distributing a 28-page booklet in which are listed 100 industrial chemicals sold by this concern and its subsidiary companies.

## Complaint Against Gilbert Spruance Co. Dismissed

Charges of commercial bribery, preferred almost two years ago against The Gilbert Spruance Co., Eugene F. Cox, secretary of the company, and James P. Dillard, one of the company's salesmen, upon the complaint of the Federal Trade Commission, have been dismissed—after many hearings in several parts of the country and after full argument before the commission. Commissioners were William E. Humphrey (chairman), Charles H. March, Edgar A. McCulloch, and Garland S. Ferguson, Jr.

This order completely exonerates all three of the respondents from the serious charges preferred against them, but the harm done to the good name of the respondents through publicity given the original charges, now disproved, is much more difficult to correct.

**Hy-Speed MIXERS**

**ARE NEVER IDLE**

Barrel to barrel . . . tank to tank . . . the wise foreman of the busy shop keeps «Hy-Speed» Mixers everlastingly at their efficient work, mixing batch after batch of finishing materials or their ingredients.

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